

We claim:

1. A structural panel system for use in constructing a building, comprising:  
a plurality of panels having a generally flat upper face and lower face in opposing relationship to each other; an edge; a flange disposed peripherally along at least a portion of the length of the edge extending parallel to the surface of the edge and above at least one of the upper and lower faces of the panels; a plurality of raised ribs extending perpendicular to and across at least one of the upper and lower faces of the panels; wherein the upper and lower faces, the edge, the flange and the plurality of ribs are integral pieces; and  
a fastening device for securing the plurality of panels to each other.
2. The structural panel system of claim 1, wherein the upper and lower faces, the edge, the flange and the plurality of ribs are made of polymer composite material.
3. The structural panel system of claim 2, wherein the polymer composite material is mixed with one or more additives selected from the group consisting of lignin, cellulose, silica, aluminosilicates, alkali metal silicates, alkaline earth metal silicates, glass fibers, and metal.
4. The structural panel system of claim 1, wherein one or more of the plurality of panels has at least one opening, wherein the opening comprises a frame for a window, door, or ventilation.
5. The structural panel system of claim 1, wherein the plurality of panels are fastened together to define an elongated planar wall having exterior and interior surfaces, a base, a first and second vertical edge, and a top.
6. The structural panel system of claim 5, wherein the first and second vertical edges have a 45-degree angle miter cut disposed along the entire length of the edges.

7. The structural panel system of claim 1, wherein at least one of the plurality of panels includes at least one conduit, pipe, channel, electrical wire or raceway integrated in the at least one of the plurality of panels.

8. The structural panel system of claim 1, wherein the plurality of panels are fastened together to define an elongated planar floor having an upper surface for walking and a lower surface contacting one of the ground and a foundation.

9. The structural panel system of claim 1, wherein the plurality of panels are fastened together to define a roof.

10. The structural panel system of claim 1, wherein the plurality of panels are fastened together to define a triangular-shaped roof truss.

11. The structural panel system of claim 1, wherein the plurality of panels are rectangular having a length dimension equal to the width dimension.

12. The structural panel system of claim 1, wherein the plurality of panels are rectangular having a length dimension that is twice the width dimension.

13. A structural panel system for use in constructing a building, comprising:  
a plurality of composite polymer panels comprising:  
a generally flat upper face and lower face in opposing relationship to each other;  
an edge disposed peripherally around the upper and lower faces;  
a flange disposed peripherally along at least a portion of the length of the edge extending parallel to the surface of the edge and above at least one of the upper and lower faces of the panels, wherein the flange includes a plurality of holes disposed along at least a portion of the length of the flange;

a plurality of horizontal raised ribs extending perpendicular to and across at least one of the upper and lower faces of the panels, wherein the plurality of horizontal raised ribs are substantially parallel to each other;

a plurality of vertical raised ribs extending perpendicular to and across the same face as the plurality of horizontal raised ribs, wherein that the plurality of vertical raised ribs bisect the plurality of horizontal raised ribs at approximately 90-degree angles; and

wherein the upper and lower faces, the edge, the flange and the plurality of horizontal and vertical raised ribs are integral pieces; and

a fastening device for securing the plurality of panels to each other.

14. The structural panel system of claim 13, wherein the composite polymer material is selected from the group consisting of virgin or recycled polyolefins.

15. The structural panel system of claim 13, wherein the composite polymer material includes the addition of one or more additives selected from the group consisting of naturally-occurring and other materials such as sugar cane bagasse, rice husks, nut shells, wood, sand, clay, talc, glass fibers, and metal.

16. The structural panel system of claim 13, further comprising a plurality of rods and other structural materials integral to the plurality of panels for increasing dimensional stability of the panel.

17. The structural panel system of claim 13, wherein the plurality of panels are fastened together and assembled into a horizontal floor, a roof opposite the floor, and a wall between the horizontal floor and the roof thereby defining an interior space.

18. The structural panel system of claim 17, wherein the wall includes an opening defining a frame for a door.

19. The structural panel system of claim 17, where the roof is a pitched roof.

20. A method of constructing a structure defined by a horizontal floor, a roof opposite the floor, and a wall between the horizontal floor and the roof, comprising the steps of:

providing a plurality of pre-fabricated structural panels, wherein the structural panels comprise a generally flat upper face and lower face in opposing relationship to each other; an edge; a flange disposed peripherally along at least a portion of the length of the edge extending parallel to the surface of the edge and above at least one of the upper and lower faces of the panels; a plurality of raised ribs extending perpendicular to and across at least one of the upper and lower faces of the structural panels; wherein the upper and lower faces, the edge, the flange and the plurality of ribs are integral pieces; and wherein the panels are made of polymer composite material;

providing a schematic drawing depicting assembly procedures;

fastening the structural panels together in accordance with the schematic drawing by abutting the flange of one panel to the flange of another panel to form the horizontal floor, roof and wall; and

fastening the floor, roof and wall together to form a structure.

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